Federally-Funded Information Technology Research and Development

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Information Technology R&D Program

- Evolved from the Federal HPCC, CIC, and NGI programs
- Provides a mechanism for focused long-term interagency R&D in information technologies
- $2 billion multi-agency Information Technology R&D Program
  - 12 agencies and departments coordinated via a “virtual agency” coordination/management structure
  - Coordinated by the National Coordination Office for Information Technology Research and Development
- Assessed by the President’s Information Technology Advisory Committee

From HPCC to IT R&D

IT R&D Coordination Structure: OSTP & NSTC

OSTP:

- Created in 1976 to provide the President with timely policy advice and to coordinate the Federal science and technology investment
- Advises the President and others within the Executive Office of the President on the impacts of science and technology on domestic and international affairs
- Works closely with the NCO Director and Interagency Working Group (IWG) on IT R&D to coordinate the interagency Networking Information Technology R&D Program
- Oversees the National Science and Technology Council (NSTC)

NSTC:

- Established by the President on November 23, 1993
- Cabinet-level council that is the principal means for coordinating science and technology across the Federal government

More information can be found at www.ostp.gov

Participating Agencies and Departments

- National Science Foundation (NSF)
- Defense Advanced Research Projects Agency (DARPA)
- National Institutes of Health (NIH)
- National Aeronautics and Space Administration (NASA)
- Department of Energy Office of Science (DOE/SC)
- National Security Agency (NSA)
- National Institute of Standards and Technology (NIST)
- National Oceanic and Atmospheric Administration (NOAA)
- Agency for Health Research and Quality (AHRQ)
- Office of the Director of Defense Research and Engineering (ODDR&E)
- Environmental Protection Agency (EPA)
- Department of Energy National Nuclear Security Administration (DOE/NNSA)

Coordination of IT R&D Programs

WHITE HOUSE

Executive Office of the President
Office of Science and Technology Policy

National Science and Technology Council

President's Information Technology Advisory Committee (PITAC)

U.S. Congress

IT R&D Authorization and Appropriations Legislation

National Coordination Office (NCO) for Information Technology Research and Development

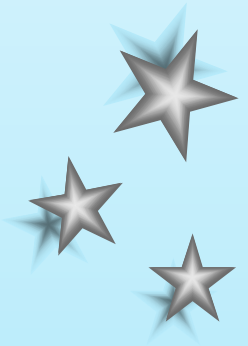
Interagency Working Group on Information Technology R&D

Participating Agencies: AHRQ, DARPA, DOE/NNSA,DOE/SC, EPA, NASA, NIH, NIST, NOAA, NSA, NSF, ODDR&E

- **High End Computing Coordinating Group (HEC)**
- **Large Scale Networking Coordinating Group (LSN)**
- **High Confidence Software and Systems Coordinating Group (HCSS)**
- **Human Computer Interaction & Information Management Coordinating Group (HCI & IM)**
- **Software Design and Productivity Coordinating Group (SDP)**
- **Social, Economic and Workforce Implications of IT and IT Workforce Development Coordinating Group (SEW)**

Interagency Working Group (IWG) on IT R&D

- Serves as the internal deliberative organization of the NSTC for IT R&D policy, program, and budget guidance
- Provides technical assistance to and coordinates agency response to recommendations of the President's Information Technology Advisory Committee
- Membership consists of representatives from twelve agencies/departments, OSTP, OMB, and the NCO



IT R&D Program Component Areas (PCAs) (1)

- **Six PCAs**
  - High End Computing (HEC)
    - Infrastructure and Applications (HEC I&A)
    - Research and Development (HEC R&D)
  - Large Scale Networking (LSN)
  - Human Computer Interaction and Information Management (HCI & IM)
  - High Confidence Software and Systems (HCSS)
  - Software Design and Productivity (SDP)
  - Social, Economic and Workforce Implications of IT and IT Workforce Development (SEW)

- **PCA Characteristics**
  - PCAs span areas with multiple agencies' involved
  - Each PCA includes hardware, software, algorithms, and applications
  - Each PCA focuses on specific R&D goals, ensures adequate investments, and maintains necessary budget visibility
  - Technology R&D may span PCAs
  - Applications span PCAs

IT R&D PCAs (2)

High End Computing (HEC)	• Advanced computing architectures including cluster and grids • Mass storage • Systems and applications software to exploit novel architectures • State-of-the-art computing systems available to researchers
Large Scale Networking (LSN)	• Network access, reliability, security, scalability, and management technologies • Active and intelligent networking and networking in extreme environments • Applications such as networks of sensors, grids, and collaboratories that require high performance networking and middleware • Testbeds
High Confidence Software and Systems (HCSS)	• Software and system availability, reliability, and safety • Information assurance, survivability, privacy, and security • Assured development and certification processes
Human Computer Interaction and Information Management (HCI & IM)	• Large scale data set processes, analysis, and visualization tools • Language-based data sets and analytical tools • Collaboratories • Multi-modal human-system interactions • Augmenting human performance
Software Design and Productivity (SDP)	• Software engineering of complex systems • End-user programming including domain-specific languages and intelligent templates, and programming by example • Component-based software development • Software for embedded systems
Social, Economic and Workforce Implications of IT and IT Workforce Development (SEW)	• Interdisciplinary research on the interactions and effects of IT in society • Curriculum development, fellowships, and scholarships • R&D in information-based learning tools, lifelong learning, and distance learning

Agency IT R&D Budgets by PCA

FY 2002 Budget Request (dollars in millions)

Agency	HEC I&A	HEC R&D	LSN	HCI& IM	HCSS	SDP	SEW	Totals
NSF	249.7	65.1	98.0	104.8	46.1	39.7	39.1	642.5
DARPA	55.5	42.7	49.2	38.2	32.9	44.6		263.1
NIH	55.1	13.7	81.1	74.6	10.1	6.0	11.4	252.0
NASA	36.1	26.0	14.4	27.8	47.1	22.4	7.0	180.8
DOE Office of Science	98.3	31.5	25.9	16.4			4.0	176.1
NSA		33.6	1.9		46.6			82.1
NIST	3.5		3.2	6.2	7.5	2.0		22.4
NOAA	13.3	1.8	2.7	0.5	1.5			19.8
AHRQ			6.7	9.2				15.9
ODUSD (S&T)		2.0	4.2	2.0	1.0	1.0		10.2
EPA	1.8							1.8
Subtotal	***513.3***	***216.4***	***287.3***	***279.7***	***192.8***	***115.7***	***61.5***	***1,666.7***
DOE /NNSA	133.8	37.0	35.5			41.1	56.5	303.9
Totals	**647.1**	**253.4**	**322.8**	**279.7**	**192.8**	**156.8**	**118.0**	**1,970.6**

President's Information Technology Advisory Committee (PITAC)

- **Top IT experts from academia and industry**
- **Advises the Administration on how to accelerate the development and adoption of information technologies**
- ***Information Technology Research: Investing in Our Future (1999)***
  - Recommended increasing strategic investments from $1.46 billion in FY 2000 to $2.83 billion in FY 2004
  - Four priority areas for long-term R&D:
    - Software
    - High-end computing
    - Scalable information infrastructure
    - Socioeconomic impact

PITAC Reports

- **In 2000, three panel reports were released:**
  - *Resolving the Digital Divide: Information, Access and Opportunity*
  - *Transforming Access to Government through Information Technology*
  - *Developing Open Source Software to Advance High End Computing*
- **In 2001, three panel reports were released:**
  - *Transforming Health Care Through Information Technology*
  - *Using Information Technology To Transform the Way We Learn*
  - *Digital Libraries: Universal Access to Human Knowledge*

1997 - 2001 Membership Included:

Industry

- Eric A. Benhamou, Ph.D. / **3Com Corporation**
- Vinton Cerf, Ph.D. / **WorldCom**
- Steven D. Dorfman (retired) / **Hughes Electronics Corporation**
- David W. Dorman / **AT&T**
- Robert Ewald / **Learn 2 Corporation**
- James N. Gray, Ph.D. / **Microsoft Research**
- W. Daniel Hillis, Ph.D. / **Applied Minds, Inc.**
- William Joy / **Sun Microsystems**
- Robert E. Kahn, Ph.D. / **Corporation for National Research Initiatives (CNRI)**
- David C. Nagel, Ph.D. / **Palm, Inc.**
- Leslie Vadasz / **Intel Corporation**
- Andrew J. Viterbi, Ph.D. / **QUALC OMM Incorporated**
- Steven J. Wallach / **Chiaro Networks**
- Irving Wladawsky-Berger, Ph.D. / **IBM Corporation**

Academia

- Ching-chih Chen, Ph.D. / **Simmons College**
- David M. Cooper, Ph.D. / **Lawrence Livermore National Laboratory**
- Dave J. Farber / **University of Pennsylvania**
- Sherrilynne S. Fuller, Ph.D. / **University of Washington School of Medicine**
- Hector Garcia-Molina, Ph.D. / **Stanford University**
- Susan L. Graham, Ph.D. / **University of California - Berkeley**
- Ken Kennedy, Ph.D. / **Rice University**
- John P. Miller, Ph.D. / **Montana State University**
- Raj Reddy, Ph.D. / **Carnegie Mellon University**
- Edward H. Shortliffe, M.D., Ph.D. / **Columbia University**
- Larry Smarr, Ph.D. / **University of California - San Diego**
- Joe F. Thompson, Ph.D. / **Mississippi State University**

Impact of PITAC

- PITAC has raised awareness of the critical need for increased Federal IT funding.
- PITAC has directly influenced the agencies' research programs to be more aligned with future industry and mission needs.
- PITAC has been a mechanism for educating industry about the resources available in the Federal IT R&D Program.

National Coordination Office (NCO) for Information Technology Research and Development (IT R&D)

Mission: *To formulate and promote the Federal Information Technology Research and Development Program to meet national goals.*

- NCO Director reports to the Director of the White House Office of Science Technology Policy (OSTP)
- Coordinates planning, budget, and assessment activities for the Federal multiagency IT R&D programs
- Supports the six technical Coordinating Groups (CGs) that report to the IWG for IT R&D
  - Research planning workshops, conferences, and meetings
  - Presentations, white papers, and research reports
- Provides technical and administrative support to the IWG and PITAC
- Informs the public of Federal achievements and challenges in IT R&D
  - Maintains a Web site
  - Publishes annual budget documents in cooperation with the IT R&D agencies
  - Publishes PITAC reports

For Further Information on Federally Funded IT R&D

Please contact us at:

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Or visit us on the Web:

www.itrd.gov